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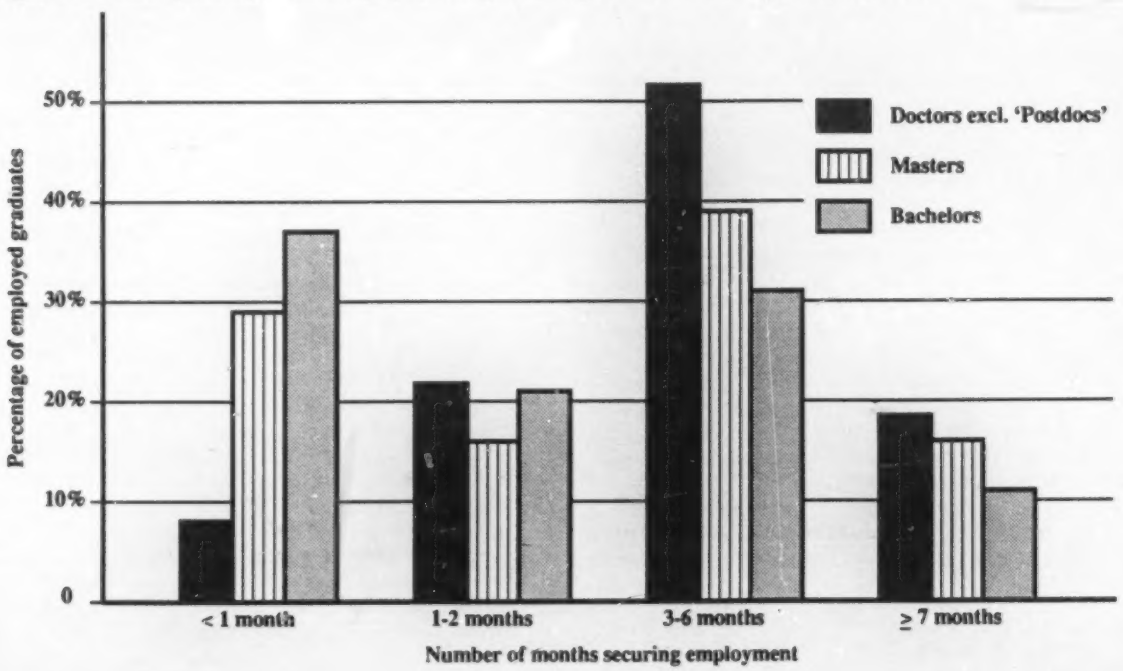
EMPLOYMENT SURVEY 1990

Against the background of a weak national economy, we followed up the employment-oriented physics and astronomy degree recipients of the class of 1990 to determine what effect the economic recession had on them. It is our aim to present as accurate a picture as possible of the entry-level employment opportunities that existed during that year. The method we used to accomplish this objective was to schedule the follow-up "Employment Survey, 1990" in December of that year and thereby allow a minimum of six months to elapse between it and two earlier surveys conducted at the end of the academic year 1989-90. Such a follow-up survey has been conducted annually since the mid 1970s. The data collected during the winter of 1990-91 form the basis for this report as they relate the diverse educational backgrounds of three levels of physics degree recipients to their interests in immediate employment. What must be taken into consideration is that the positions sought by bachelors, masters and doctors differ significantly from one another; hence we address different sets of questions to the three groups of graduates. And, most importantly, the members of each group were urged to comment on the extent to which their expectations matched their post-degree experiences.

A question that applied to all survey participants concerned the number of months they spent to secure suitable employment. Their answers corresponded to a wide range of time periods which are summarized in **Figure I**. Doctorate recipients exclude 'postdocs' so as to focus on the potentially permanent positions comparable to those accepted by the masters and bachelors. The first time period—less than one month—is intended to identify graduates who have positions already lined-up when their degrees were conferred. In the class of 1990, 29% of the masters and 37% of the bachelors fell into that group. Two thirds of the doctoral graduates (or an eleven percentage-point increase over the previous year) require at least three months before accepting a potentially permanent position. A comparison of the data on bachelors and masters, with those of the early 1980s, shows that the proportion of graduates who required more than six months, doubled.

Figure I. Time spent by 1989-90 physics degree recipients in securing employment.



Member Societies: The American Physical Society • Optical Society of America • Acoustical Society of America • The Society of Rheology • American Association of Physics Teachers
American Crystallographic Association • American Astronomical Society • American Association of Physicists in Medicine • American Vacuum Society • American Geophysical Union

Table I. Changes in occupational status of physics degree recipients between the summer of 1990 and the following winter.

Employment status reported by physics degree recipients, summer 1990.		Occupational status, winter 1990–91						
		'Postdoc' or student	Employment full-time permanent	Other	Employment outside the U.S.	Not employed and seeking in the U.S.	Total N	Total %
Doctors								
Newly accepted employment		0	109	–	–	1	110	22%
Continuing employment		4	12	–	–	–	16	3
'Postdoc'		271	4	–	9	1	285	58
Leave the United States		3	1	–	35	–	39	8
Other		1	–	1	–	3	5	1
Not employed and seeking		19	9	–	2	10	40	8
Total respondents	N	298	135	1	46	15	495	
	%	60	27	–	10	3		100%
Masters								
Newly accepted employment		2	53	4	–	1	60	41%
Continuing employment		1	34	2	–	–	37	26
Military		–	14	–	–	–	14	10
Leave the United States		1	–	–	–	–	1	–
Other		1	8	1	–	1	11	8
Not employed and seeking		1	12	4	–	5	22	15
Total respondents	N	6	121	11	–	7	145	
	%	4	83	8	–	5		100%
Bachelors								
Newly accepted employment		6	230	6	5	4	251	38%
Continuing employment		2	68	5	1	6	82	12
Military service		–	72	–	–	–	72	11
Summer employment		13	43	5	2	14	77	12
Undecided		3	18	9	–	8	38	6
Other		–	24	16	–	6	46	7
Not employed and seeking		7	54	6	–	29	96	14
Total respondents	N	31	509	47	8	67	662	
	%	5	77	7	1	10		100%

As new graduates experience stiffer competition for positions that utilize a physics education, there is a tendency to accept initial employment that may prove to be inappropriate after a few months; hence a follow-up survey that allows a six-month period to elapse provides the opportunity to examine the occupational status of degree recipients at two different times thereby determining what changes occurred, if any. **Tables I** and **II** measure those changes for each of the three groups of physics and astronomy degree recipients respectively. Taking into account some recent employment patterns, which primarily affect doctoral graduates, each table includes the category "Employment outside the United States" into which 10% of the physicists, as well as 9% of the astronomers, fell. Both tables are arranged in such a way that their first columns list the occupational status reported by the graduates in the summer of 1990 and, reading across, the column headings indicate the occupational status during the following winter. Thus, the third row in **Table I** shows that of the 285 physics doctorate recipients who held 'postdocs,' 271 of them still held them six months later; four 'postdocs' had switched to permanent positions, nine had left the U.S. and one 'postdoc' reported seeking employment.

In discussing the new physics masters, represented in part by 145 respondents, we need to explain that the data shown in **Table I** underrepresents a group of new masters who are neither inexperienced nor seeking initial employment. What accounts for such a scenario is that approximately one third of each year's terminal master's degree recipients hold full-time positions while studying for that degree on a part-time basis. In the class of 1990, this group was estimated at 175 graduates. Only 37 of the survey respondents represent this group and are described as "Continuing employment;" all except one, who became a full-time student, reported no change in their occupational status between the two surveys. Focusing attention on the 22 graduates who identified themselves as unemployed in the summer survey, we found that only five of them were still seeking employment six months later while two previously-employed masters sought new positions.

Each year physics bachelors comprise the largest of the six groups of respondents to this annual survey. We divided up the 662 respondents from the class of 1990 into seven categories, the first three of which present a relatively stable picture for the six-month period covered by **Table I**. The remaining four categories include the bachelors who had not yet accomplished their employment goals. For example, by accepting summer employment, the bachelors merely postponed their job hunt and ultimately thirteen of the 77 bachelors decided to pursue graduate studies instead. This option was also chosen by seven members of the "unemployed" group, though a majority of the 96 unemployed new graduates found full-time permanent positions in the time between the two surveys. The group of 67 bachelors who were seeking employment during the winter of 1990-91 includes 38 graduates who appear to be

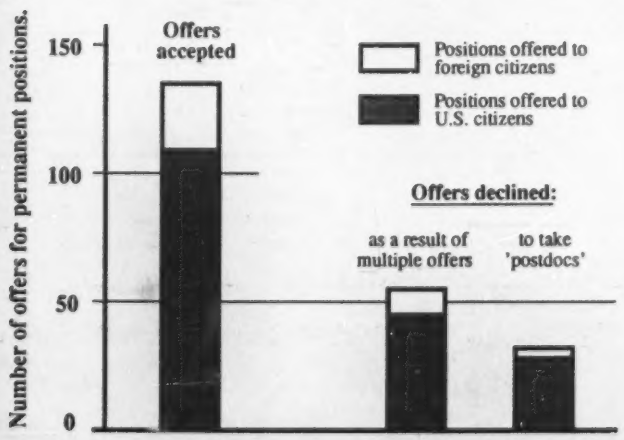
Table II. Changes in occupational status of astronomy degree recipients between the summer of 1990 and the following winter.

Employment status reported by astronomy degree recipients, summer 1990.		Occupational status, winter 1990–91					
		'Postdoc' or student	Employed	Postdoctoral employment outside the U.S.	Not employed and seeking in the U.S.	Total N	Total %
Doctors							
Regular employment		–	15	–	–	15	26%
'Postdoc'		33	–	3	–	36	63
Leave the United States		–	–	2	–	2	4
Not employed and seeking		2	–	–	2	4	7
Total respondents	N	35	15	5	2	57	
	%	61	26	9	4		100%
Masters							
Regular employment		–	2	–	–	2	20%
Not employed and seeking		1	3	–	1	5	50
No immediate plans		1	2	–	–	3	30
Total respondents	N	2	7	–	1	10	
	%	20	70	–	10		100%
Bachelors							
Regular employment		–	9	–	1	10	38%
Miiitary service		–	3	–	–	3	12
Summer employment		–	5	–	1	6	23
Other		–	3	–	–	3	12
Not employed and seeking		–	3	–	1	4	15
Total respondents	N	–	23	–	3	26	
	%	–	88	–	12		100%

involved in changing jobs rather than having been unemployed since graduation.

Although the types of employment sought by physics graduates at the three degree levels differ significantly from one another, each group included a slightly larger proportion of degree recipients, than in the previous year, who were not employed and seeking at the time of the follow-up survey. There has been little variation in the annual number of astronomy doctorates conferred recently, and a similar statement can be made about the degree recipients' employment pattern. The great majority of new astronomers accepted 'postdocs' some of which require the graduates to leave the United States. Of the fifteen doctoral astronomers whom **Table II** shows as having accepted permanent positions, all but one were U.S. citizens. Among the astronomy masters and bachelors, all except four graduates appear to have found suitable positions, but they are less likely to identify with that profession.

Figure II. Offers for permanent employment reported by new doctoral physicists, 1990.



There is general agreement that postdoctoral positions are readily available but have the disadvantages of being temporary and rarely linked to a high salary. Half of the new physicists, irrespective of citizenship, who accepted 'postdocs' reported multiple postdoctoral offers to choose from. Let us therefore focus attention on the availability of potentially permanent employment for new physicists in the United States. Since all our information comes from the individual graduates, we asked them to specify what type and how many employment offers they received, so that we were able to single out the offers for permanent employment. Thus we found that three groups of respondents reported a total of 222 such offers. The largest group consisted of 97 doctoral graduates who accepted the single offer each of them received; the second group consisted of 38 new physicists whose multiple offers totaled 93 from which this group chose and accepted 38 positions. The third group consisted of 25 respondents who reported 32 offers, none of which they accepted because they decided to take 'postdocs' instead. In presenting these data in **Figure II**, we distinguished between offers that were accepted and those that were declined. Perhaps an unlikely, but possible, scenario implies that a declined permanent position could have been offered sequentially to more than one graduate who, in turn, may have reported that offer in the Employment Survey. A further detail shown in **Figure II** is the citizenship of the new physicists to whom the potentially permanent positions were offered.

Table III. Occupational status, in the U.S., of experimental and theoretical physicists by type of dissertation research, 1989–90.

Occupational status		Experimentalists U.S.	Experimentalists Foreign	Experimentalists Sub-total	Theoreticians U.S.	Theoreticians Foreign	Theoreticians Sub-total	Total
Full-time employed		36%	26%	33%	36%	9%	25%	31%
'Postdoc'		61	72	64	60	88	71	66
Not empl. and seeking		3	2	3	4	3	4	3
		100%	100%	100%	100%	100%	100%	100%
Total	N	214	81	295	95	59	154	449
	%			66%			34%	100%

A further analysis of the initial employment doctoral physicists accepted in the U.S., links the graduate's citizenship to his or her dissertation research. **Table III** highlights these two characteristics and shows how influential a degree recipient's citizenship was in 1990. Among U.S. graduates there was no difference between the proportion of experimentalists and theoreticians (36% each) who held potentially permanent rather than temporary postdoctoral positions. Among foreign graduates these ratios differed substantially: only one in ten foreign theoreticians secured potentially permanent employment in the U.S., whereas one in four experimentalists found permanent positions.

Table IV. Characteristics of postdoctoral and full-time employed physics and astronomy doctorate recipients, 1989–90.

Characteristics	Physics 'Postdocs'	Physics Full-time employed	Astronomy 'Postdocs'	Astronomy Full-time employed	Characteristics
Sex					Sex
Female	12%	8%	17%	20%	Female
Male	88	92	83	80	Male
Age					Age
26 or younger	5%	2%	3%	–	26 or younger
27 years	10	9	11	–	27 years
28 years	13	7	9	27%	28 years
29 years	16	13	23	13	29 years
30 years	16	11	11	20	30 years
31–32 years	21	25	26	7	31–32 years
33 or older	19	33	17	33	33 or older
Citizenship					Citizenship
U.S.	63%	81%	69%	93%	U.S.
Foreign	37	19	31	7	Foreign
Major subfield of dissertation					Major subfield of dissertation
Astrophysics	8%	8%	34%	33%	Cosmology/extragalactic/ quasi-stellar objects
Condensed matter	34	36			
Electron/atomic/molecular	11	5	14	–	Interstellar matter & gaseous nebulae
Elementary particles	19	8			
Mathematical physics	5	8	11	20	Stellar atmospheres and spectra/ stellar evolution/solar and stellar interiors
Nuclear physics	7	5			
Optics/lasers	3	10			
Plasma/fluids/chaos	4	4	11	7	Solar systems
Median monthly salary	$2460	$3580	$2500	$3000	
Number of respondents	298	135	35	15	

Note: This table includes only degree recipients who remained in the U.S. for their initial employment.

To what extent do the background characteristics of new physicists and astronomers differ when we divide them on the basis of temporary or permanent initial employment? **Table IV** shows 'postdocs' to be younger, to include a larger proportion of foreign degree recipients and to command a lower salary than those who described their positions as potentially permanent. Comparing new physicists and astronomers in the latter category, the median monthly starting salary for physicists is 19% higher than that reported by the astronomers.

After spending four or more years on extending the frontiers of research in a narrow specialty of physics, any reluctance on the part of doctorate recipients to change subfields is understandable. Of the two types of initial employment available postdoctoral fellowships are more likely than potentially permanent positions to offer research opportunities in the subfield of the graduate's dissertation. To substantiate this statement we present **Table V**, which focuses on subfield mobility. The upper portion of this table presents data on those graduates who had accepted postdoctoral fellowships; hence we find large percentages along the diagonal. By contrast the lower half of this table illustrates the adaptability of new physicists whose permanent positions are spread among a larger number of specialties.

Table V. Subfield mobility of new doctoral level physicists, 1989–90.

	Subfields of 'postdoc'								
Major subfield of dissertation	Astrophysics	Condensed matter	Elec./ atom./ molec.	Elementary particles	Mathematical physics	Nuclear physics	Plasma/ fluids/ chaos	Other	Total respondents
Astrophysics	73%	5%	–	9%	5%	–	–	8%	22
Condensed matter	–	78	–	–	1	1%	–	20	103
Electron/atomic/molec.	–	–	56%	–	–	–	–	44	32
Elementary particles	4	–	–	89	4	–	–	3	56
Mathematical physics	–	8	–	23	54	–	8%	7	13
Nuclear physics	–	–	–	10	–	90	–	–	20
Plasma/fluids/chaos	–	–	–	–	20	–	70	10	10
									256

	Subfields of potentially permanent employment									
Major subfield of dissertation	Astrophysics	Condensed matter	Elec./ atom./ molec.	Elem. part.	Mathematical physics	Optics/ lasers	Applied physics	Inter. disc.	Other	Total respondents
Astrophysics	60%	–	–	–	–	–	–	10%	30%	10
Condensed matter	–	57%	2%	2%	–	6%	21%	4	8	53
Electron/atomic/molec.	–	–	43	14	–	14	–	–	29	7
Elementary particles	–	18	–	27	–	–	18	9	28	11
Mathematical physics	–	–	–	9	46%	–	9	–	36	11
Optics/lasers	–	–	8	–	–	54	15	8	15	13
Applied physics	–	–	–	–	–	–	–	–	–	9
Interdisciplinary	–	–	–	–	–	–	–	70	30	10
										124

Table VI. Employment with potential permanence, in the U.S., accepted by 1989–90 physics doctorate recipients.

		Type of employer						Total	
		Univ.	Coll.	Industry	Gov't.	FFRC	Other	N	%
Subfield of PhD	Astrophysics	5	2	1	–	1	1	10	8%
	Condensed matter	10	10	22	3	3	1	49	36
	Electron/atomic/molec.	2	1	2	–	2	–	7	5
	Elementary particles	5	1	2	1	2	–	11	8
	Mathematical physics	3	4	4	–	–	–	11	8
	Nuclear physics	1	–	4	–	1	–	6	4
	Optics/lasers	2	1	6	2	2	–	13	10
	Cross-disciplinary	4	2	1	1	0	1	9	7
	Other	2	2	8	5	2	–	19	14
Work activity	Teaching	6	12	–	–	–	–	18	13%
	Research	5	–	6	5	2	–	18	13
	Teaching/research	19	11	–	–	–	–	30	22
	Res./dev./des.	2	–	39	5	10	1	57	42
	Other	2	–	5	2	1	2	12	9
Type of research	Experimental	24	16	37	9	9	2	97	72%
	Theoretical	10	7	13	3	4	1	38	28
Interested in a job change	Yes	16	13	16	4	4	1	54	40%
	No	15	8	31	8	6	1	69	51
	Unsure	3	2	3	–	3	1	12	9
Starting salary	Monthly median	$2500	$2670	$4000	$3590	$4170	–	132	$3580
Total respondents	N	34	23	50	12	13	3	135	
	%	25	17	37	9	10	2		100%

Table VII. Characteristics* of 1989–90 physics masters related to the type of employment secured.

		Type of employer							
Characteristics		Ed. inst.	Industry: manuf.	Industry: service	Civilian government	Military service	Other	Not empl. and seeking	Total
Sex	Female	10%	14%	16%	34%	5%	32%	14%	16%
	Male	90	86	84	66	95	68	86	84
Age	24 or younger	13%	3%	16%	17%	–	20%	–	8%
	25–26 years	23	41	38	34	6%	–	37%	33
	27–28 years	13	18	–	34	32	40	–	19
	29–30 years	20	12	16	4	12	–	–	11
	31 or older	31	26	30	11	50	40	63	29
Citizenship	U.S.	94%	97%	92%	100%	94%	100%	100%	97%
	Foreign	6	3	8	–	6	–	–	3
Type of graduate inst.	Public	77%	73%	84%	83%	76%	59%	100%	78%
	Private	23	27	16	17	24	41	–	22
Use of physics training	Extensive	85%	49%	56%	71%	69%	73%	–	64%
	Little	15	49	16	29	25	–	–	31
	None	–	2	28	–	6	27	–	5
Major subfield of degree	Applied physics	7%	9%	16%	26%	–	14%	–	10%
	Condensed matter	21	21	–	35	23%	–	29%	20
	Cross disciplinary	11	10	8	13	15	55	29	14
	Optics	7	9	16	4	23	14	–	14
Major work activity	Res./dev./des.	24%	74%	42%	53%	60%	55%	–	55%
	Data analysis	4	12	18	30	6	45	–	15
	Teaching	65	–	–	–	20	–	–	15
Median monthly salary		$2400	$3100	$2750	$2600	$2900	$2200	–	$3000
Total		19%	39%	8%	15%	9%	4%	6%	100%

**Our estimates of the employed and unemployed physics masters were 540 and 35 respectively.*

The following five tables concentrate on initial employment with potential permanence by relating pertinent characteristics of physics doctors, masters and bachelors to major types of U.S. employers. Thus for the doctorate recipients, presented in **Table VI**, we list five distinct groups of employers that include two groups of educational institutions and two categories for the government. Among the characteristics of doctoral physicists we present the answers to the question: Are you interested in a job change? A majority of those employed by four-year colleges answered this question affirmatively; the industrial physicists, on the other hand, by a ratio of 2:1 were not interested in changing jobs. The distribution of median salaries reflects increases for government employment and the colleges, but decreases for industry and the universities when compared with those of the previous year.

In order to call attention to differences in the characteristics of new masters we changed the listing of employers from the one presented for the doctoral physicists. Thus **Table VII** combines all academic employers but divides industry and the government into two categories each. With this distribution we can identify a ten percentage-point shift away from service industries. The proportions employed by manufacturing industries as well as the civilian government increased during the most recent year. This redistribution could be attributed to the need for technically trained graduates in research, development and design, the work activities primarily utilized by manufacturers and the government. The graduates' perception of the extent to which they use their physics training varies significantly for the different employer groups. For example, masters who accepted academic employment rank highest (85% of this group) in reporting extensive use of their training, while barely half of the group employed by manufacturers describe their use of physics training as "extensive." On the other hand, manufacturing industries pay the highest median salary. Another proportion that varied widely among the employers of new masters is that of women; they comprised 34% of the new physics masters hired by the civilian government and only 5% of those who entered military service. The median monthly salary reported for all employers combined was 3000 and represents a 12% increase over the previous year.

The large number of physics bachelors among the respondents to this Employment Survey make a more extensive analysis possible than that presented for the physics masters and doctorate recipients. Thus **Tables VIII** and **IX** link specific characteristics of the bachelors to seven types of employers, and **Table X** focuses on the major work activities the new physics bachelors reported.

Our general assessment of the job market in 1990 is that it was less favorable than the one described by the 1989 bachelors. Not only did the proportion of unemployed bachelors increase by three percentage-points in one year, but we also created a new column in **Table VIII** for graduates who were employed but did not hold full-time positions; this group comprised 7% of the respondents and one third of its members were women. The unemployed bachelors, on the other hand, included the second lowest proportion of women. By examining the methods bachelors used to secure employment, we noticed a substantial increase in the proportion of bachelors who utilized their university placement services. Nevertheless, responding to newspaper advertisements with resumes and using "contacts" remained the two most effective methods. By separating service industries from the manufacturing segment, we find significant differences in the extent to which the graduates make use of their physics training. Only 11% of the bachelors whose employment was described as a service industry reported "extensive" use of their training compared to 35% of those who accepted positions in manufacturing.

Table VIII. Characteristics of 1989–90 physics bachelors related to type of employment secured.

Characteristics		Type of employer: Sec. school	Coll./ univ.	Industry: manuf.	Industry: serv.	Civil. gov't.	Military service	Nonprf. org.	Part-time employment	Not empl.	Total: N	Total: %
Sex	Female	26%	17%	17%	19%	24%	7%	35%	32%	12%	117	19%
	Male	74	83	83	81	76	93	65	68	88	514	81
Age	22 or younger	50%	43%	32%	40%	27%	58%	35%	28%	28%	234	37%
	23 years	22	27	36	27	22	25	35	28	21	175	28
	24–25 years	11	3	10	19	19	14	15	19	19	94	15
	26 or older	17	27	22	14	32	3	15	25	32	128	20
Primary method which secured employment†	Placement	16%	23%	17%	21%	22%	5%	10%	13%	–	94	18%
	Resume's/ads.	29	17	43	32	37	3	25	21	–	170	32
	Contacts/faculty	26	57	32	38	31	5	40	47	–	184	34
	Military	–	–	–	–	–	84	–	–	–	55	10
Number of job offers	1	42%	57%	54%	62%	56%	89%	75%	85%	2%	356	63%
	2	26	28	27	18	25	8	10	9	–	114	20
	>3	32	15	19	20	19	3	15	6	–	95	17
Region of employment*	Northeast	24%	20%	20%	26%	14%	–	30%	26%	–	110	22%
	Southeast	21	7	18	18	23	–	15	6	–	82	17
	Central/Mountain	39	43	40	39	47	–	25	40	–	198	40
	Pacific	16	30	22	17	16	–	30	28	–	102	21
Use of physics training	Extensive	43%	45%	35%	11%	42%	45%	30%	7%	–	164	29%
	Little	46	41	50	49	48	49	45	41	–	269	48
	None	11	14	15	40	10	6	25	52	–	131	23
Total respondents	N	38	30	157	149	59	64	20	47	67	631**	
	%	6	5	25	24	9	10	3	7	11		100%

**The 8 bachelors employed outside the United States are excluded from this distribution.*
***This total excludes bachelors who chose graduate study after exploring the job market.*
† Only 535 bachelors indicated a method.

Table IX. Selected characteristics of 1989–90 physics bachelors that effect their employment.

Characteristics		Type of employer: Sec. school	Coll./ univ.	Industry: manuf.	Industry: serv.	Civil. gov't.	Military	Nonprf. org.	Part-time employment	Not empl.	Totals: %	Totals: N	%
Sex	Female	9%	4%	22%	24%	12%	3%	6%	13%	7%	100%	117	19%
	Male	5	5	25	24	9	12	3	6	11	100	514	81
Type of bachelor's institution	Public	4%	4%	27%	20%	10%	10%	4%	9%	12%	100%	362	57%
	Private	8	5	22	28	10	10	3	6	8	100	269	43
Type of degree	BS	4%	5%	27%	24%	10%	10%	3%	7%	10%	100%	469	74%
	BA	12	5	20	22	8	9	4	9	11	100	162	26
Median monthly salary		$2220	$1850	$2500	$2170	$2330	$1920	$1630	–	–	All employers		$2220

Note: This table excludes 31 bachelors who chose graduate study after exploring the job market.

Table X. Median monthly salaries paid by civilian employers to physics bachelors for selected work activities, winter 1990–91.

	Selected work activity: Dev. & design	Res. & dev.	Programming/ data anal.	Technician	Teaching	Nonphysics prof 'l work	All empl. comb.
Salary	$2520	$2460	$2410	$1670	$2170	$2500	$2330
% respondents	13	16	17	7	11	5	

Using the same employer distribution for bachelors we look at the influence three characteristics have on initial employment from a different angle in **Table IX**. This table shows more clearly that the largest proportion of women as well as men accepted positions in industry, that service industries employ proportionately more graduates from private than public institutions and that manufacturers favor bachelors with science rather than arts degrees.

The median monthly salary offered to physics bachelors from the class of 1990 reflected an 11% increase over the previous year. The last row of **Table IX** presents the medians paid by each of seven types of employers thereby showing how little the median monthly salaries differ between secondary schools and service industries. What needs to be explained is that secondary school teachers receive only nine or ten monthly installments each year while industrial employees are paid those monthly salaries twelve times each year.

A different view of starting salaries for physics bachelors takes into account that work activities often determine salaries irrespective of the type of employer. Hence we present **Table X** which makes it clear that the high industrial salaries are paid for development and design work and not to the technicians.

Table XI. Doctoral astronomers from the class of 1989–90 whose initial employment was potentially permanent.

Characteristics		Type of employer: Univ.	4-yr. coll.	Gov.'t.	FFRC	Total N
Time spent seeking:						
3 months		1	2	1	1	5
4–6 months		1	2	1	1	5
7–9 months		4	–	1	–	5
Offers for permanent employment:						
1 offer		4	3	2	–	9
2 offers		–	1	–	–	1
3 offers		2	–	1	2	5
Sex	Female	1	2	–	–	3
	Male	5	2	3	2	12
Total		6	4	3	2	15

The conventional path taken by doctoral astronomers to enter employment is via one or more 'postdocs.' The 1990 graduates received more offers for permanent positions than the members of the class of 1989 and fewer of them left the United States. **Table XI** offers some details on the 15 new astronomers who appeared to bypass the traditional postdoctoral stage. The table presents three characteristics and relates them to four types of employers. Thus we find that securing a non-postdoctoral position at a university is likely to require seven to nine months, that one third of the new astronomers received three offers for permanent employment though not necessarily from the same type of employer they chose to work for and that two of the three women among this group of astronomers accepted positions in four-year colleges.

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